Small Business Innovation Research

Loop Heat Pipe for High Density Small Satellite Thermal Control

Thermacore, Inc.

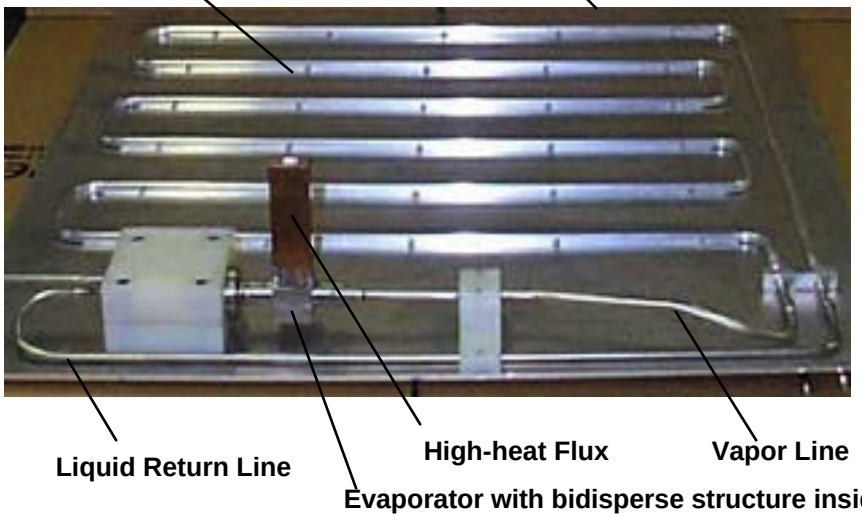
Lancaster, PA

INNOVATION

Improved high-heat-flux Loop Heat Pipe operating efficiency from 20 W/ cm^2 to 100 W/cm^2 on the evaporator wall.

ACCOMPLISHMENTS

- A bidisperse structure is used on the outer layer of the evaporator wick with several-micrometers pore size.
- Passive energy transports capillary-driven. This passive operation results in high reliability and long life.
- Long small-diameter transport lines with smooth inner walls offers design flexibility by transferring heat away to areas where dissipation is more convenient or airflow is greater. The lines can be bent and formed into a variety of configurations while maintaining their heat transfer capabilities.
- Cost effective in OEM production quantities. The long-term reliability and zero-maintenance contributes to a lower total applied cost of the loop heat pipe solution than other less-reliable cooling products.



High-Heat-Flux Loop Heat Pipe

COMMERCIALIZATION IN PROGRESS

- Gravity-aided modifications of a high-heat-flux Loop Heat Pipe will be used in cooling systems for commercial server boards where CPUs dissipate up to 200 W each.

GOVERNMENT SCIENCE/APPLICATIONS

- The high-heat-flux Loop Heat Pipe is being tested at GSFC for satellite applications.

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